

**ABSTRACT OF THE DISCLOSURE**

A heat exchanger device includes an extruded body that includes one or more layers of channels for coolant flow therethrough, the channels generally having inner diameters of between about 50 microns to about 2000 microns. The device is formed of a material having a high thermal conductivity to facilitate transfer of heat from the heating components present in the subject cooling application to the coolant passing through the heat exchanger and to be compatible with materials of the heating components. The device material is selected from the group consisting of ceramic oxides, ceramic carbides, ceramic nitrides, ceramic borides, ceramic silicides, metals, and intermetallics, and combinations thereof. The heat exchanger device is formed from an extruded filament that is arranged to give the desired channel configuration. The filament includes a central, removable material and an outer material that forms the channel walls upon removal of the central material.